UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/086,084	02/26/2002	Zining Wu	MP0118	1813

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EXAMINER
AGHDAM, FRESHTEH N

ART UNIT	PAPER NUMBER
2631	

DATE MAILED: 06/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

Office Action Summary	Application No.	Applicant(s)
	10/086,084	WU ET AL.
	Examiner	Art Unit	
	Freshteh N. Aghdam	2631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _26 February 2002_.

2a)☐ This action is **FINAL.**   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-86_ is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-18,20,22,25-46,48,50,54-75,77,79 and 83-86_ is/are rejected.

7)☒ Claim(s) _19,21,23,24,47,49,51-53,76,78 and 80-82_ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

Claim Objections

Claims 21, 25, 28, 49, 54, 78, and 83 are objected to because of the following

informalities:

As to claims 21, 49, and 78, the variable "s" is undefined and; therefore, causes

the claims to become indefinite.

As to claims 25, 54, and 83, the vaiable "M" is undefined and; therefore causes

the claims to become indefinite.

As to claim 28, the word "that" should change to "than" in order to overcome the

indefiniteness in the claim at page 20, line 2.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 20,26, 27, 28, 29, 48, 55, 56, 57, 58, 77, 84, 85, and 86 are rejected

under 35 U.S.C. 103(a) as being unpatentable over Simmons et al (2002/0094048).

As to claims 1, 28, and 58, Simmons et al teaches detecting a sync mark in an

incoming bit stream of a communications channel, comprising a bit/ symbol comparing

circuitry that compares the sync mark on a bit-by-bit basis under good signal conditions
(Pg. 3, Par. 36); and a block comparing circuitry that compares the sync mark on a
greater unit basis under bad signal conditions (i.e. for example low SNRs) see (Pg. 3,
Par. 37). One of ordinary skill in the art would clearly recognize that comparing to the
bit-by-bit correlation a greater unit with more characters is chosen for correlation.
Therefore it would have been obvious to one of ordinary skill in the art to use the
teaching of Simmons et al in order for the received signal to be processed more
accurately (Pg. 3, Par. 36).

As to claims 20, 48, and 77, Simmons et al teaches all the subject matters
claimed above, except for a symbol includes a plurality of bits. One of ordinary skill in
the art would clearly recognize that each symbol includes a plurality of bits.

As to claims 26, 55, 56, 84, and 85, Simmons et al teaches all the subject
matters claimed above, except for the channel irregularities producing long consecutive
bit errors and wherein the channel irregularities are caused by at least one of thermal
asperity and media defects. One of ordinary skill in the art would clearly recognize that it
is well known in the art fort the channel irregularities being due to thermal asperity
and/or media defects and therefore, causing bit errors.

As to claims 27, 57, and 86, As to claims 27, 57, and 86, Simmons et al teaches
sync pattern detection being implemented in software and executed in a processor (Pg.
1, Par. 9). One of ordinary skill in the art would clearly recognize that it is well known in
the art to use a memory for the execution purposes.

Claims 2, 3, 4, 9-17, 30, 31, 32, 37-45, 59, 60, 61, and 66-74 are rejected under

35 U.S.C. 103(a) as being unpatentable over Simmons et al, and further in view of the

admitted prior art.

As to claims 2, 30, and 59, Simmons et al teaches a front-end that outputs the

incoming bit-stream and generates a channel irregularity signal (i.e. signal conditions;

Pg. 3, Par. 36 and 37) when channel irregularities exist. Simmons et al is silent about

the front end communicating with the correlation unit. The admitted prior art teaches a

front end that communicates with a bit decision unit see (Fig. 2, Blocks 32 and 33).

Therefore, it would have been obvious to one of ordinary skill in the art to combine the

teaching of the admitted prior art with Simmons et al in order to provide an incoming bit-

stream to the bit decision circuit for further processing (Pg. 1, Par. 3).

As to claims 3, 31, and 60, the admitted prior art teaches a bit decision circuit

that decodes (i.e. a Viterbi circuit) the incoming bit-stream received from the front-end

unit 32 (Pg. 1, Par. 3). Therefore it would have been obvious to one of ordinary skill in

the art to combine the teaching of the admitted prior art with Simmons et al in order to

improve data processing in the communication device.

As to claims 4, 32, and 61, the admitted prior art teaches a buffer that

communicates with the bit decision circuit and stores bits of the incoming bit-stream

(Fig. 2, Pg. 1, Par. 3). One of ordinary skill in the art would clearly recognize that usage

of memory is well known in the art in order to store a signal and its characteristics (i.e.

phase, amplitude, and etc).

Claims 5, 6, 7, 8, 33, 34, 35, 36, 62, 63, 64, and 65 are rejected under 35 U.S.C.

103(a) as being unpatentable over Simmons et al and the admitted prior art, further in

view of Tsunoda (US 6,104,560).

As to claims 5, 6, 7, 8, 33, 34, 35, 36, 62, 63, 64, and 65, Simmons et al and the

admitted prior art teach all the subject matters claimed above, except for a first post

coding circuit that communicates with the bit decision circuit. Tsunoda, in the same field

of endeavor, teaches a viterbi decoding unit (i.e. bit decision circuit) that communicates

with an NRZ decoding unit (i.e. post coding circuit) see (Fig. 1 and 5; Col. 5, Lines 51

and 52; Col. 6, Lines 9-15). One of ordinary skill in the art would clearly recognize that

different versions of NRZ coding is well known in the art of disk storage systems.

Therefore, it would have been obvious to one of ordinary skill in the art to combine the

teaching of Tsunoda with Simmons et al and the admitted prior art in order to reproduce

an accurate NRZ data (Col. 3, Lines 45 and 46).

As to claims 9, 37, and 66, one of ordinary skill in the art would clearly recognize

that using a memory to store a signal is well known in the art. Therefore, it would have

been obvious to one of ordinary skill in the art to use a memory to store a signal.

As to claims 10, 12, 13, 38, 40, 41, 67, 69, and 70, Simmons et al and the

admitted prior art teach all the subject matters claimed above, except for a second post

coding circuit that communicates with the bit decision circuit. Tsunoda, in the same field

of endeavor, teaches a viterbi decoding unit (i.e. bit decision circuit) that communicates

with an NRZ decoding unit (i.e. post coding circuit) see (Fig. 1 and 5; Col. 5, Lines 51

and 52; Col. 6, Lines 9-15). One of ordinary skill in the art would clearly recognize that

different versions of NRZ coding is well known in the art of disk storage systems.

Therefore, it would have been obvious to one of ordinary skill in the art to combine the

teaching of Tsunoda with Simmons et al and the admitted prior art in order to reproduce

an accurate NRZ data (Col. 3, Lines 45 and 46).

As to claims 11, 39, and 68, one of ordinary skill in the art would clearly

recognize that using a memory to store a signal is well known in the art. Therefore, it

would have been obvious to one of ordinary skill in the art to use a memory to store a

signal.

As to claims 14, 15, 42, 43, 71, and 72, Simmons et al teaches all subject

matters claimed above, except for the bit and/or comparing circuit implementing a bit

and/or level-matching rule. The admitted prior art teaches a bit comparing circuit

implementing a bit level matching rule (Fig. 2, Block 40; Pg. 2, Par. 3). One of ordinary

skill in the art would clearly recognize that since a symbol is a plurality of bits the level-

matching rule could be implemented on a symbol-by-symbol basis. Therefore, it would

have been obvious to one of ordinary skill in the art to combine the teaching of the

admitted prior art with Simmons et al in order to perform sync mark detecting on a bit-

by-bit basis.

As to claims 16, 17, 44, 45, 73, and 74, Simmons et al and the admitted prior art

teach all the subject matters claimed above, except for the bit and/or symbol comparing

circuit generating a sync mark found state when the bit and/or symbol level-matching

rule is satisfied. The admitted prior art teaches a bit comparing circuit generating a sync

mark found state when the bit level-matching rule is satisfied (Pg. 2, Par. 3). Therefore,

it would have been obvious to one of ordinary skill in the art in order to detect sync

marks.

Claims 18, 22, 46, 50, 75, and 79 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Simmons et al, further in view of Cloke et al (US 6,519,104).

As to claims 18, 46, and 75, Simmons et al teaches all the subject matters

claimed above, except for the sync mark in the incoming bit-stream has large Hamming

and symbol distances to provide low early alignment and low sync mark miss

probabilities. Cloke et al, in the same field of endeavor, teaches a disk drive comprising

a sync mark code that has large Hamming distance to provide low alignement and low

sync mark miss probabilities (Col. 36, Lines 55-67; Col. 37, Lines 1-17 Therefore, it

would have been obvious to one of ordinary skill in the art to combine the teaching of

Cloke et al with Simmons et al in order to reduce the probability of misdetection (Col.

37, Lines 15-17).

Claims 25, 54, and 83 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Simmons et al and the admitted prior art, further in view of Cloke et al

As to claims 25, 54, and 83, Simmons et al and the admitted prior art teach all

the subject matters claimed above, except for the bit level-matching rule is met if bit

differences are greater than or equal to $M-[(dH-1)/2]$. Cloke et al, in the same field of

endeavor, teaches the bit level matching rule is met if bit differences are greater than or

equal to $M-[(dH-1)/2]$ see (Col. 37, Lines 6-17). Therefore, it would have been obvious

to one of ordinary skill in the art to combine the teaching of Cloke et al with Simmons et

al and the admitted prior art in order to reduce the probability of misdetection (Col. 37, Lines 15-17).

Allowable Subject Matter

Claims 19, 21, 23, 24, 47, 49, 51, 52, 53, 76, 78, and 80-82 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

As to claims 19, 47, and 76, the prior art of record fails to teach the longest error event in the sync mark causes x bit errors and wherein a symbol length of the symbols in the incoming bit-stream is limited to x-1.

As to claims 21, 49, and 78, the prior art of record fails to teach the sync mark includes (4+3s) symbols and the symbol comparing circuit implements a (2+s) out of (4+3s) symbol matching rule for identifying sync marks.

As to claims 23, 51, 52, 80, and 81, the prior art of record fails to teach the sync mark does not contain "101" or "010" bits and does not contain "10001" or "01110" patterns starting immediately before a symbol boundary.

As to claims 24, 53, and 82, the prior art of record fails to teach the bit level-matching rule is met if bit differences are less than half of the Hamming distance dH.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Abbey (US 6,438,187), Chiba et al (US 5,557,594), Schetelig et al (US 2002/0048330), Blaum et al (US 5,999,110), and McClellan et al (US 2002/0063984).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Freshteh N. Aghdam whose telephone number is (571) 272-6037. The examiner can normally be reached on Monday through Friday 9:00-5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on (571) 272-3021. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Freshteh Aghdam

June 5, 2005

MOHAMMED GHAYOUR
SUPERVISORY PATENT EXAMINER